FLOOD INSURANCE STUDY

COMPLETED
70

ORIGINAL

WALTON COUNTY, FLORIDA

UNINCORPORATED AREAS

APRIL 30, 1985

Federal Emergency Management Agency

COMMUNITY NUMBER 120317

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TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
1.1	Purpose of Study	1
1.2	Authority and Acknowledgments	1
1.3	Coordination	1
2.0	AREA STUDIED	2
2.1	Scope of Study	2
2.2	Community Description	2
2.3	Principal Flood Problems	4
2.4	Flood Protection Measures	8
3.0	ENGINEERING METHODS	8
3.1	Hydrologic Analyses	8
3.2	Hydraulic Analyses	15
4.0	FLOOD PLAIN MANAGEMENT APPLICATIONS	21
4.1	Flood Boundaries	21
4.2	Floodways	22
5.0	INSURANCE APPLICATION	24
5.1	Reach Determinations	24
5.2	Flood Hazard Factors	25
5.3	Flood Insurance Zones	25
5.4	Flood Insurance Rate Map Description	26

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TABLE OF CONTENTS (Continued)

		Page
6.0	OTHER STUDIES	26
7.0	LOCATION OF DATA	32
8.0	REFERENCES AND BIBLIOGRAPHY	32

FIGURES

Figure	1	-	Vicinity Map	3
Figure	2	-	Historical Storm Tracks	6
Figure	3	-	Transect Location Map	17
Figure	4	-	Transect Schematic	21
Figure	5	-	Floodway Schematic	24

TABLES

Table	1	-	Summary of Discharges	10
Table	2	-	Parameter Values for Surge Elevations	11
Table	3	-	Summary of Stillwater Elevations	12
Table	4	-	Transect Locations, Stillwater Starting Elevations, and Initial Wave Crest Elevations	18
Table	5	-	Floodway Data	23
Table	6	-	Flood Insurance Zone Data	27
Table	7	-	Coastal Flood Insurance Zone Data	28

EXHIBITS

Flood Profiles

Choctawhatchee River	Panels	01P - 05P
Alaqua Creek	Panels	06P - 07P

Flood Boundary and Floodway Map Index
Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

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FLOOD INSURANCE STUDY

WALTON COUNTY, UNINCORPORATED AREAS, FLORIDA

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Type 19 Flood Insurance Study is to investigate the existence and severity of flood hazards in the Unincorporated Areas of Walton County, Florida, and to aid in the administration of the Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to revise the Flood Insurance Rate Map developed from data presented in the Type 15 Flood Insurance Study. Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain management. Minimum flood plain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for Alaqua Creek and the hydrologic analysis for the Choctawhatchee River were performed by Stottler Stagg & Associates (Study Contractor). The hydraulic data for the Choctawhatchee River were also obtained from Stottler Stagg & Associates. The storm surge elevations for Choctawhatchee Bay and the Gulf of Mexico were obtained from GKY & Associates, Inc. (Study Contractor). This work was performed for the Federal Emergency Management Agency (FEMA) under Contract No. EMW-C-0969. The hydraulic analysis for the Choctawhatchee River and the wave height analyses for Choctawhatchee Bay and the Gulf of Mexico were performed by FEMA. This study was completed in October 1984.

1.3 Coordination

This Flood Insurance Study was initialized August 8, 1979, for Walton County in a letter sent to Mr. Bob Anderson (Chairman, Walton County Commission) from the Study Contractor, Stottler Stagg & Associates.

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In the letter, a flood information checklist was requested dealing with possible community flood data and sketches or maps confirming the agreed upon study area. Also contained in the letter was an invitation to schedule a community meeting to further explain the study and coordinate field reconnaissance work efforts. Pertinent information was collected and survey crews began work shortly thereafter.

On June 10, 1985, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the Study Contractors, FEMA, and the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Walton County, Florida. The area of study is shown on the Vicinity Map (Figure 1). The incorporated areas within the county were excluded from this study.

Flooding caused by overflow of Alaqua Creek from just south of Eglin Air Force Base to Alaqua Bayou was studied by detailed methods. The Choctawhatchee River, within the corporate limits, was studied by limited detailed methods.

A detailed coastal flooding analysis was performed on the complete coastline of Walton County, where the flooding sources are the Gulf of Mexico and Choctawhatchee Bay.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through October 1988. The scope and methods of study were proposed to and agreed upon by FEMA and Walton County.

2.2 Community Description

Walton County is located in the northwestern Florida Panhandle. It is bordered by Okaloosa County on the west, and Holmes, Washington, and Bay Counties on the east. Covington and Geneva Counties, Alabama, serve as the northern border, while the Gulf of Mexico serves as the southern border. In 1980, the population of Walton County was reported to be 21,300. De Funiak Springs is the largest city and county seat having a reported 1980 population of 5,563 (Reference 1).

Industry in the county is diversified, with forestry and farming serving as the most important industries. The 25 miles of coastline along the Gulf of Mexico, plus 50 miles of shoreline in Choctawhatchee Bay, attract a large tourist industry. Commercial fishing is also important along the coastline.

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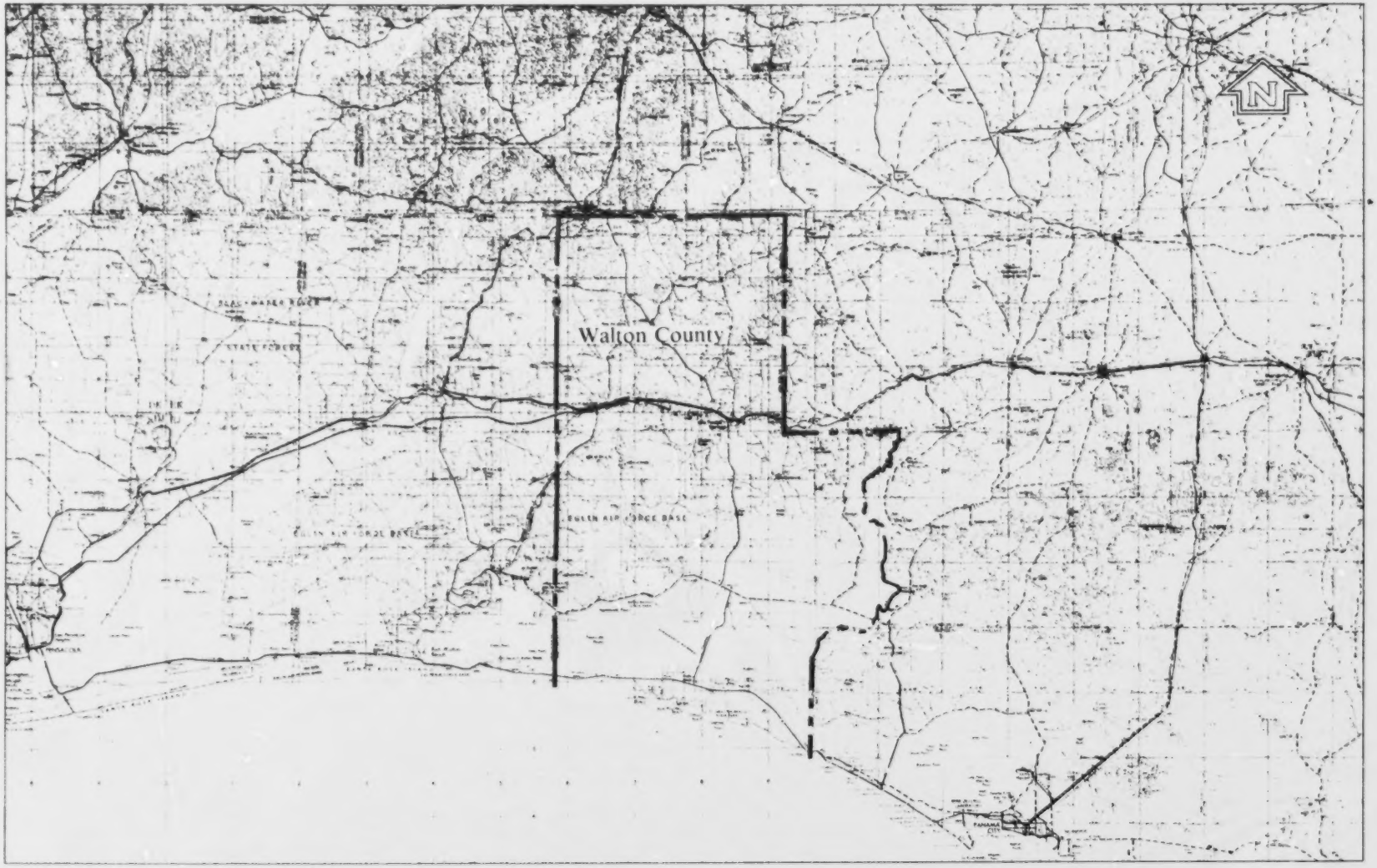

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL
(UNINCORPORATED AREAS)

APPROXIMATE SCALE

13 0 13 26 39 MILES

VICINITY MAP

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Major highways that provide transportation in the county include U.S. Route 331, Interstate 10, U.S. Route 98, and State Roads 20, 83, and 81. Other transportation includes the Louisiana & Nashville Railroad and a commercial barge industry that operates on the Intracoastal Waterway.

The topography of Walton County varies. Terrain along the Gulf of Mexico is high enough to make a barrier against many of the hurricane inland penetration surges. The inland areas are generally rolling, with large areas of forest. Poor drainage in some of the areas forms pockets for stormwater and causes extensive areas of swamp. The terrain in Walton County rises to an elevation of 348 feet National Geodetic Vertical Datum of 1929 (NGVD), the highest elevation in Florida, at a location near the Alabama border.

The climate of Walton County is subtropical, with a moderating influence from the Gulf of Mexico. The average daily temperature varies during the year from 55 degrees Fahrenheit (F.) to 82 degrees F. The average annual precipitation is 57.6 inches.

Choctawhatchee Bay is a prominent feature in the county. It is approximately 6 miles wide and extends for approximately 18 miles into the county. It is traversed by the Intracoastal Waterway, which has a dredged channel to the east. The Choctawhatchee River flows into the eastern end of the bay over a wide, swampy flood plain. The river has a large basin that begins in Alabama and is subject to severe rainfall flooding.

2.3 Principal Flood Problems

Flood problems in the county can be attributed to both riverine flooding and tidal surge. Riverine flooding occurs as a result of both naturally occurring storm patterns and severe precipitation due to hurricanes.

Some of the worst floods to occur in northwestern Florida were the result of high intensity rainfall during hurricanes. The time of concentration of runoff for large basin rivers in northwestern Florida may be several days. Consequently, peak flows do not, as a rule, coincide with hurricane tides at the coast. The smaller streams, however, have a shorter time of concentration and the floodflow occurring concurrently with the storm surge is more likely. This greatly increases the likelihood of inundation of low-lying areas along the coast. The maximum rainfall occurs in the eastern half of the storm system. As the storm passes inland, its intensity decreases, but heavy rainfall continues. Total precipitation of 12 inches recorded at a single station during a hurricane is not uncommon, and in northwestern Florida, rainfall has been as high as 24 inches for the duration of the storm (Reference 2).

Normal rainfall patterns are greatest during two distinct periods: 1) during summer, due to afternoon and evening thunderstorms, and 2) during late winter and early spring, due to frontal systems.

The Choctawhatchee River, a major river in the county, accounts for much of the flooding in the area. The Choctawhatchee River is characterized by wide, flat flood plains varying from several thousand feet to several miles wide. The flat slopes and wide, heavily vegetated flood plains enhance the

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flood problem by preventing the rapid drainage floodwaters. At flood stage it covers large areas, flooding forest and farm land, fishing resorts, and other businesses built on the flood plain.

Major floods to date include the 1929 flood and the 1975 flood. The 1929 flood was the largest flood ever recorded. At the gaging station near Bruce, Florida, the Choctawhatchee River reached an elevation of 28.94 feet mean sea level (msl), 7.46 feet higher than the next largest flood. The 1975 flood was the second largest flood recorded; it reached an elevation of 21.48 feet msl. The recurrence interval of this 1975 flood is once every 19 years while the 1929 flood interval would be less than once in 500 years.

Alaqua Creek, though not as large as the Choctawhatchee River, experiences flooding from both extensive rainfall and high storm surges. Even though no severe flooding problems have been recorded, Alaqua Creek poses a threat to the area's residential housing and also to future development along the stream.

The coastal areas of Walton County are subject to flooding from tidal surges associated with hurricanes both along the Gulf of Mexico and inside Choctawhatchee Bay. Generally, the terrain inland along Choctawhatchee Bay rises fairly rapidly and flooding from surges is restricted to only short distances behind the bay.

Walton County has experienced flooding from several hurricanes since 1870. Reports of high water marks for the hurricanes of 1936 were 8.4 feet NGVD at Fort Walton Beach, Okaloosa County, and from 7 to 8 feet NGVD at Destin, in Okaloosa County. This compares with the GKY 100-year surge prediction of 2 to 7 feet NGVD. The prediction does not incorporate the effects of wind driven waves or the tidal influences of the heavenly bodies.

Figure 2 shows the tracks of hurricanes affecting the Florida Panhandle from 1877 to 1975. Basic information concerning hurricane tracks was taken from the maps of North Atlantic tropical cyclone tracks for the years of 1871 through 1977, compiled by the National Oceanic and Atmospheric Administration (NOAA) (Reference 3).

Brief notes on the history and damages caused by hurricanes were abstracted from reports by the U.S. Army Corps of Engineers (COE) (References 4 and 5), Garriott (Reference 6), Sumner (Reference 7), and Patterson, Bailey, and Paulhus (Reference 8). Additional information on hurricane history and damages, particularly for recent storms, was obtained from papers published in the Monthly Weather Review.

The following is a list of significant storms affecting the panhandle during this century. Damage figures are those determined for values at the time of the storm; no attempt has been made to adjust these figures to present day values.

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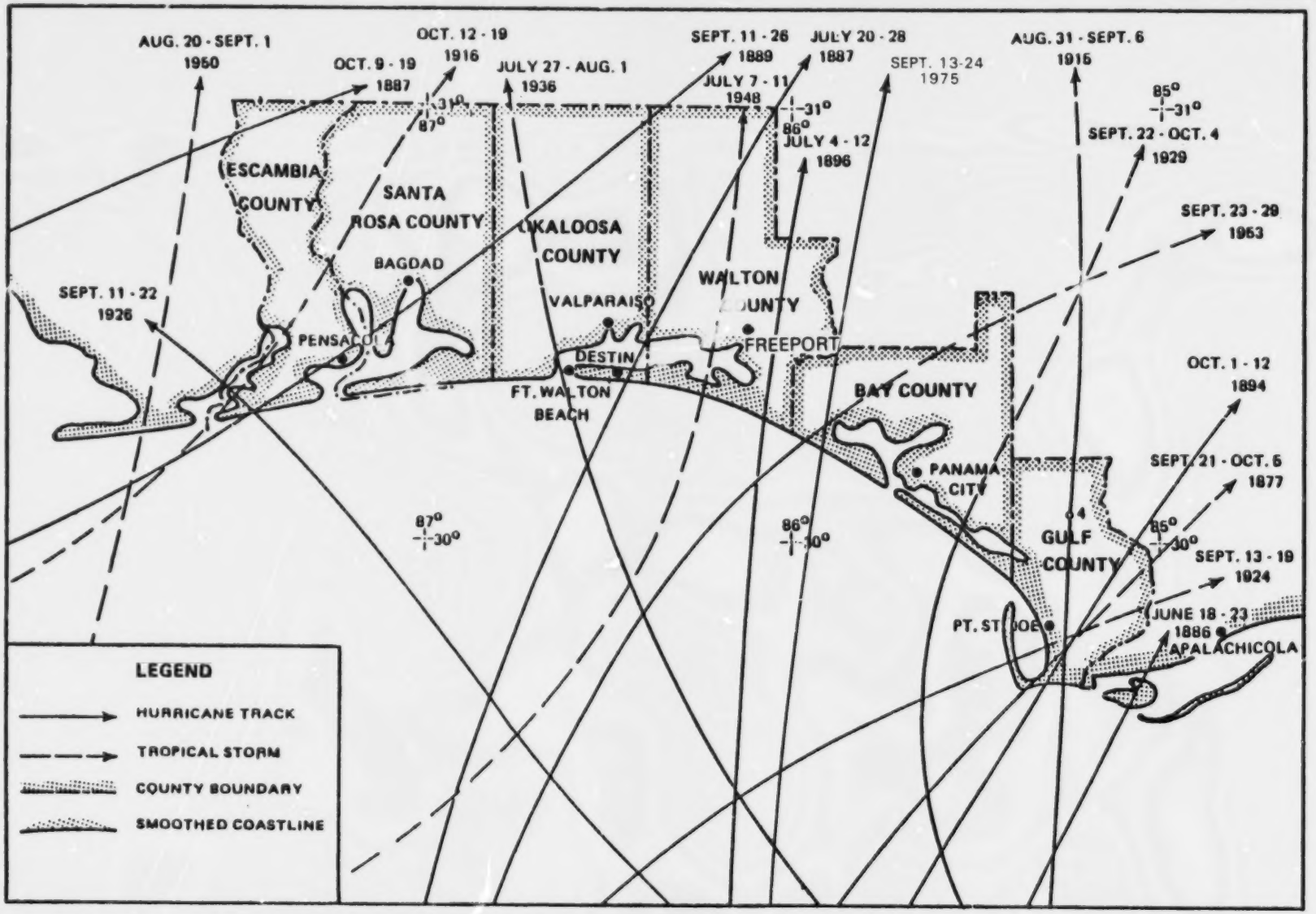

FIGURE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

HISTORICAL STORM TRACKS

WALTON COUNTY AND VICINITY

1915 (August 31 - September 6)

This storm made landfall near Port St. Joe with the heaviest damage occurring to the east near Apalachicola, Florida. Damage to property was estimated to be $40,000. Tide levels of 7.0 feet msl were recorded at Carrabelle, Florida.

1917 (September 21 - September 29)

This storm made landfall near Fort Walton Beach with damage estimated at $270,000. Tide levels of 7.8 feet msl were recorded at Fort Barrancas, Florida.

1924 (September 13 - September 19)

Crossing the shoreline near Port St. Joe, this storm raised damage estimated at $275,000. Winds at 80 mph were recorded at Panama City, Florida.

1929 (September 21 - October 4)

The center of this storm entered the coast near Panama City. Damage from the storm was estimated at $500,000.

1936 (July 27 - August 1)

The center of this storm passed over Fort Walton Beach and Valparaiso, causing an estimated $150,000 in damage. Tide levels of 7 to 8 feet msl were recorded at Destin. A high water mark at 8.4 feet msl was reported at Fort Walton Beach.

1950 Hurricane Baker (August 20 - September 1)

The center of this storm entered the coast between Pensacola, Florida, and Mobile, Alabama, causing damage estimated at $550,000. Tide levels recorded during the passage of this storm include: 4.5 feet msl at Pensacola and Carrabelle; 5 feet msl at Panama City; and, 6.8 feet msl at Apalachicola.

1953 Hurricane Florence (September 23 - September 28)

This storm made landfall between Panama City and Fort Walton Beach with damage estimated at $150,000.

1956 Hurricane Flossy (September 21 - September 30)

This was a major hurricane that caused extensive damage along the Louisiana, Mississippi, and Alabama coasts. Total damage was estimated at $25 million. Tide levels of 5.5 feet msl were recorded at Fort Walton Beach. Tides at Destin was estimated at 6 to 7 feet msl.

1972 Hurricane Agnes (June 14 - June 22)

This storm made landfall near Panama City. Tide levels of 8 to 9 feet msl were recorded at several points from St. George Island to Panacea, Florida.

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1975 Hurricane Eloise (September 13 - September 24)

This storm made landfall about 40 miles west of Panama City. High water marks ranging from 10 to 18 feet msl were found between Destin and Port St. Joe. Residential damage was extensive, over $2.5 million in Walton County alone.

2.4 Flood Protection Measures

There are no extensive constructions for flood protection. A few individuals have built private bulkheads, and some new homes are being constructed with the first floor above the 100-year base flood elevation.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community. Analyses were also carried out to establish the peak elevation-frequency relationships for each coastal flooding source studied in detail.

Two methods were used to determine the discharges used on the streams studied. For gaged sites with 10 years or more of record, historical data were fitted to a log-Pearson Type III distribution to obtain the desired discharge-frequency relationship. In this analysis, the methods established in Bulletin 17A (Reference 9) were followed utilizing data provided by the Tallahassee Subdistrict of the U.S. Geological Survey (USGS). For ungaged sites, regional analyses were performed using the procedures in USGS Water Supply Paper (WSP) No. 1674 "Magnitude and Frequency of Floods in the United States" (Reference 10).

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To determine the accuracy of the data and curves in WSP No. 1674, various frequency flows at gaged sites were estimated by regional analysis and compared to the log-Pearson Type III distributions obtained from the data at the gages. The log-Pearson Type III distributions were consistently steeper than the regionally determined distributions and always provided the better fit to the actual measured data. Variations in the estimated flows by the two methods often exceeded 100 percent, particularly at the higher recurrence intervals.

To minimize the disparity between the regionally determined and log-Pearson Type III flows, it was necessary to modify the regional curves on a hydrologic subunit basis to reflect more accurately flood frequency conditions. The regional analysis methodology of WSP No. 1674 was developed utilizing a log-normal distribution for data through 1961. The initial modifications to the regional analysis were to include all data through the 1977 Water Year and to reconstruct the regional curves in WSP No. 1674 using log-Pearson Type III distributions rather than log-normal distributions. This was done by replotting the Mean Annual Flow (Q_m) vs. Drainage Area relationship, taking Q_m from the log-Pearson Type III curves at each gage. The ratio of Peak Flow (Q_p/Q_m) vs. Recurrence Interval was also replotted using log-Pearson Type III values. By incorporating skew into the regional analysis, the regionally determined distributions were made similar to the log-Pearson Type III distributions at the gages. The differences in the estimated flows at the gages by the two methods were also smaller, reflecting the fact that the flows were determined by similar distributions and that the regional analysis included an additional 16 years of record at many stations.

To further reduce the discrepancies in flows and to bring the regionally determined flows within the expected sampling error at the gages, an adjustment factor was applied to the Mean Annual Flow used in the regional analysis. This adjustment was determined in the following manner. For each gaged site in a hydrologic region, flows from the 2-, 10-, 25-, 50-, 100-, and 500-year return period floods determined by a log-Pearson Type III analysis were divided by the regional Q_p/Q_m ratios to give values that represent what Q_m should have been for the regional analysis to duplicate exactly the log-Pearson Type III values at a gage. The six values so obtained were averaged to give a single value, Q_m', for the station. Plotting Q_m' against Q_m yielded three straight lines, each representing a different hydrologically similar region. The slope of these curves provided a single adjustment factor for each region, applicable to Q_m determined from the Q_m vs. Drainage Area relationship. This procedure required only one initial correction for streams in a hydrologic subunit and yielded regionally determined flows that approximate those determined by a log-Pearson Type III analysis. Over the range of return periods of interest to this study, the regionally estimated flows fall within the 50-percent confidence interval defined by the confidence limits applicable to the log-Pearson Type III distributions at the gages.

Peak discharges for the 10-, 50-, 100-, and 500-year floods of each riverine flooding source studied in detail in the community are shown in Table 1.

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TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
ALAQUA CREEK at mouth	124	6,690	11,305	13,700	20,560
CHOCTAWHATCHEE RIVER just upstream of mouth	4,384	64,800	106,000	127,000	187,000

Discharges for the streams studied by approximate methods were obtained from regional equations taken from a USGS publication (Reference 11).

Inundation from the Gulf of Mexico and Choctawhatchee Bay caused by passage of storms (storm surge) was determined by the joint probability method (Reference 12). The storm populations were described by probability distributions of 5 parameters that influence surge heights. These were central pressure depression (which measures the intensity of the storm), radius to maximum winds, forward speed of the storm, shoreline crossing point, and crossing angle. These characteristics were described statistically based on an analysis of observed storms in the vicinity of Walton County. Primary sources of data for this were obtained from "Some Climatological Characteristics of Hurricanes and Tropical Storms, Gulf and East Coasts of the United States" by NOAA (Reference 13) and "Meteorological Considerations Pertinent to Standard Project Hurricane, Atlantic and Gulf Coasts of the United States", also by NOAA (Reference 14). A summary of the parameters used for the area is presented in Table 2, Parameter Values for Surge Elevations.

For areas subject to flooding directly from the Gulf of Mexico and Choctawhatchee Bay, the FEMA standard storm surge model was used to simulate the coastal surge generated by any chosen storm (that is, any combination of the 5 storm parameters defined previously). By performing such simulations for a large number of storms, each of known total probability, the frequency distribution of surge height can be established as a function of coastal location. These distributions incorporate the large-scale surge behavior, but do not include an analysis of the added effects associated with much finer scale wave phenomena, such as wave height or runup. As the final step in the calculations, the astronomic tide for the region is then statistically combined with the computed storm surge to yield recurrence intervals of total water level (Reference 15).

The storm-surge elevations for the 10-, 50-, 100-, and 500-year floods have been determined for Walton County and are shown in Table 3, Summary of Stillwater Elevations. The analyses reported herein reflect the stillwater elevations due to tidal and wind setup effects, and include the contributions from wave action effects.

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FLOODING SOURCE AND LOCATION	TRANSECT	STILLWATER ELEVATION (FEET NGVD)			
		10% (10-YEAR)	2% (50-YEAR)	1% (100-YEAR)	0.2% (500-YEAR)
CHOCTAWHATCHEE BAY					
Along shoreline from Wheeler Point to LaGrange Bayou (including causeway just south of Wheeler Point)	29	3.0	5.4	6.3	7.7
Northern end of LaGrange Bayou	N/A	3.9	6.7	7.8	9.5
Along shoreline from LaGrange Bayou to Motes Point	30	2.8	4.9	5.8	7.2
Along shoreline in the vicinity of Motes Point	31	2.6	4.7	5.5	6.9
Along shoreline in the vicinity of Piney Point and Alaqua Bayou	32	2.7	4.7	5.6	6.9
Along shoreline of Alaqua Bayou	N/A	2.5	4.4	5.2	6.4
Along shoreline from Alaqua Point to Basin Bayou	33	2.2	4.0	4.7	5.9
Along shoreline from Sharon Lake to Basin Bayou	34	1.8	3.1	3.7	4.7
Along shoreline from Okaloosa-Walton county boundary to just northeast of Choctaw Beach	35	1.6	2.7	3.0	3.9

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

SUMMARY OF STILLWATER ELEVATIONS

CHOCTAWHATCHEE BAY

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FLOODING SOURCE AND LOCATION	TRANSECT	STILLWATER ELEVATION (FEET NGVD)			
		10% (10-YEAR)	2% (50-YEAR)	1% (100-YEAR)	0.2% (500-YEAR)
CHOCTAWHATCHEE BAY					
Along shoreline just east of Hewett Bayou	N/A	1.6	2.5	2.9	3.6
Along shoreline in the vicinity of Mussett Bayou	N/A	1.8	3.1	3.7	4.7
Along shoreline from Live Oak Point to Hogtown Bayou	27	1.6	2.6	3.1	4.0
Along shoreline from Live Oak Point to just southeast of Alligator Point	N/A	1.7	2.9	3.4	4.3
Along shoreline from about 3000 feet to 10,000 feet southeast of Alligator Point	N/A	1.9	3.4	4.0	5.1
Along shoreline just west of U.S. Route 331 causeway	N/A	2.4	4.3	5.0	6.4
Along shoreline just east of U.S. Route 331 causeway	N/A	2.6	4.7	5.5	7.0
Along shoreline from Tucker Bayou to Jolly Bay and along west side of U.S. Route 331 causeway	28	3.2	5.8	6.8	8.5
Along Intracoastal Waterway	N/A N/A	3.4 3.6	N/A N/A	7.2 7.5	N/A N/A

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

SUMMARY OF STILLWATER ELEVATIONS

CHOCTAWHATCHEE BAY

CENTRAL PRESSURE DEPRESSION (MILLIBARS)	15.2	24.2	33.2	38.2	49.2	60.2	75.2	79.2
ASSIGNED PROBABILITIES	0.32	0.27	0.06	0.11	0.09	0.08	0.05	0.02
STORM RADIUS TO MAXIMUM WINDS (NAUTICAL MILES)	12			24			36	
PROBABILITY	0.23			0.50			0.27	
FORWARD SPEED (KNOTS)	7			13			19	
PROBABILITIES: ENTERING	0.46			0.36			0.18	
DIRECTION OF STORM PATH (DEGREES FROM TRUE NORTH)		138	ENTERING	167		196		225
PROBABILITY		0.25		0.23		0.27		0.25
FREQUENCY OF STORM OCCURENCE (STORM/NAUTICAL MILE/YEAR)	0.002213							

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

PARAMETER VALUES FOR SURGE ELEVATIONS

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FLOODING SOURCE AND LOCATION	TRANSECT	STILLWATER ELEVATION (FEET NGVD)			
		10% (10-YEAR)	2% (50-YEAR)	1% (100-YEAR)	0.2% (500-YEAR)
GULF OF MEXICO					
Along shoreline in the vicinity of the Okaloosa-Walton County boundary	1	2.8	4.6	5.4	7.0
Along shoreline in the vicinity of Miramar Beach and Gulf Pines	2	2.8	4.7	5.5	7.2
Along shoreline from Gulf Pines to Powell Lake located at the Walton-Bay County boundary	3-25	2.8	4.6	5.3	6.9
CHOCTAWHATCHEE BAY					
Along shoreline in the vicinity of the Okaloosa-Walton County boundary and just west of Horseshoe Bayou	N/A	1.4	2.2	2.5	3.2
Along shoreline between Okaloosa-Walton County boundary and Horseshoe Bayou	N/A	1.3	2.0	2.4	3.2
Along shoreline from Horseshoe Bayou to Buck Bayou	26	1.4	2.1	2.6	3.7
Along shoreline from Mack Bayou to Hewett Bayou	N/A	1.3	1.8	2.1	2.7

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

SUMMARY OF STILLWATER ELEVATIONS

GULF OF MEXICO—CHOCTAWHATCHEE BAY

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the riverine sources studied were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals.

Cross sections, dams, and culverts for the backwater analysis of the streams studied in detail were obtained by field survey. The surveys were tied into USGS benchmarks so that all elevations were referenced to the NGVD.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles. For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map.

Channel roughness factors (Manning's "n") used in the hydraulic computations, where chosen by engineering judgment and based on field observations of the streams and flood plain area. Channel roughness values in the study range from 0.035 to 0.04 with flood plain values ranging from 0.1 to 0.18.

Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 16). Starting water-surface elevations for main streams were calculated using the slope-area method. Computed water-surface elevations were used to construct profiles for floods of the selected recurrence intervals. The acceptability of the hydraulic input data was checked using engineering judgment and by comparing computed results with historical data recorded at the gaging stations, where such stations existed.

A review of the HEC-2 computations on the Choctawhatchee River revealed that the estimated 100-year flood widths did not extend across the obvious flood plain at many of the cross sections. A close inspection of the survey data indicated that, in these cases, the survey had ended on islands in the flood plain. Although, upon inspection, it appeared that the survey had not been exceeded, it did leave larger portions of the flood plain out of the backwater calculations. As a result, the floodway calculations were invalid. Because of this, approximate methods were used to estimate the 100-year flood elevations on the Choctawhatchee River. The method used involved friction calculations to determine elevations at the cross sections in question as well as interpolation between cross sections that appeared to have acceptable HEC-2 results.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. In cases where the 50- and 100-year flood elevations are close together, due to limitations of the profile scale, only the 100-year profile has been drawn.

The hydraulic analyses for the riverine study are based only on the effects of unobstructed flow. The flood elevations shown on the profiles are, thus, considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

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Hydraulic analyses, considering storm characteristics and the shoreline and bathymetric characteristics of the flooding sources studied, were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of the shorelines.

The FEMA storm surge model was utilized to simulate the hydrodynamic behavior of the surge generated by the various synthetic storms. This model utilizes a grid pattern approximating the geographical features of the study area and the adjoining areas. Surges were computed utilizing grids of 5 statute miles and 1 statute mile, depending on the resolution required.

Underwater depths and land heights for the model grid systems were obtained from topographic maps at a scale of 1:24000 with a contour interval of 10 or 5 feet (References 17 and 18).

The methodology for analyzing the effects of wave heights associated with coastal storm surge flooding is described in a report prepared by the National Academy of Sciences (Reference 19). This method is based on the following major concepts. First, depth-limited waves in shallow water reach a maximum breaking height that is equal to 0.78 times the stillwater depth. The wave crest is 70 percent of the total wave height above the stillwater level. The second major concept is that wave height may be diminished by dissipation of energy due to the presence of obstructions, such as sand dunes, dikes and seawalls, buildings, and vegetation. The amount of energy dissipation is a function of the physical characteristics of the obstruction and is determined by procedures prescribed in Reference 19. The third major concept is that wave height can be regenerated in open fetch areas due to the transfer of wind energy to the water. This added energy is related to fetch length and depth.

Wave heights were computed along transects (cross-section lines) that were located along the coastal areas, as illustrated in Figure 3, Transect Location Map, in accordance with the "Users Manual for Wave Height Analysis" (Reference 20). The transects were located with consideration given to the physical and cultural characteristics of the land so that they would closely represent conditions in their locality. Transects were spaced close together in areas of complex topography and dense development. In areas having more uniform characteristics, they were spaced at large intervals. It was also necessary to locate transects in areas where unique flooding existed and in areas where computed wave heights varied significantly between adjacent transects.

Each transect was taken perpendicular to the shoreline and extended inland to a point where wave action ceased. Along each transect, wave heights and elevations were computed considering the combined effects of changes in ground elevation, vegetation, and physical features. The stillwater elevations for the 100-year flood were used as the starting elevations for these computations. Wave heights were calculated to the nearest 0.1 foot, and wave elevations were determined at whole-foot increments along the transects. The location of the 3-foot breaking wave for determining the terminus of the V zone (area with velocity wave action) was also computed at each transect. Table 4 provides a listing of the transect locations and stillwater starting elevations, as well as initial wave crest elevations.

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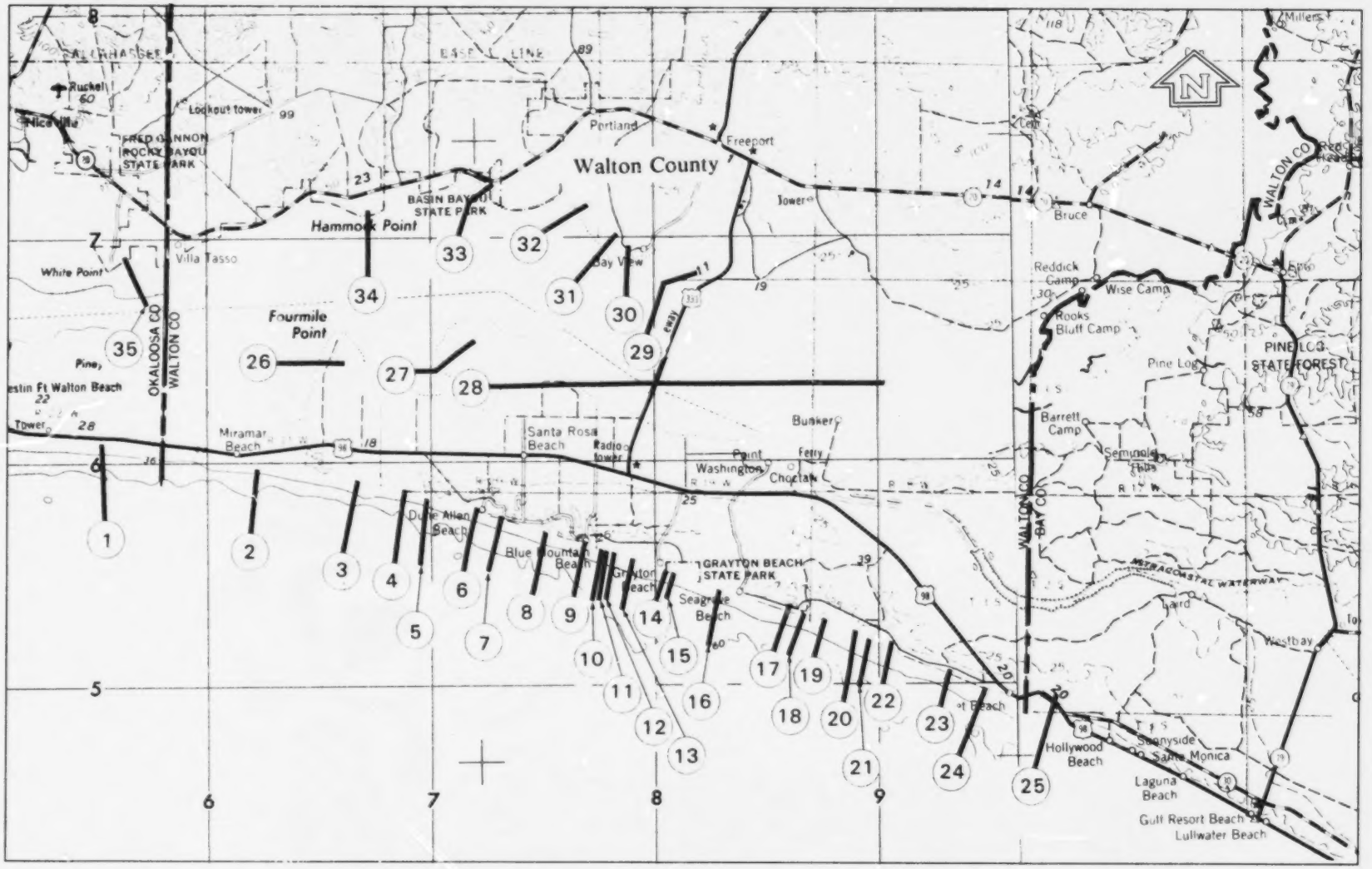

FIGURE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

APPROXIMATE SCALE

4 0 4 8 12 MILES

TRANSECT LOCATION MAP

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TABLE 4 - TRANSECT LOCATIONS, STILLWATER STARTING ELEVATIONS, AND INITIAL WAVE CREST ELEVATIONS

Transect	Location	Elevation (Feet) Stillwater	Wave Crest
1	about 4.5 miles east of East Pass, just west of the Okaloosa-Walton county boundary, at the Gulf of Mexico	5.4	8.4
2	about 3,000 feet east of Miramar Beach at the Gulf of Mexico	5.5	8.5
3	at Morris Lake at the Gulf of Mexico	5.3	8.2
4	at Stalworth Lake at the Gulf of Mexico	5.3	8.2
5	about 2,200 feet southeast of Stalworth Lake at the Gulf of Mexico	5.3	8.2
6	at Oyster Lake at the Gulf of Mexico	5.3	8.2
7	about 3,000 feet southeast of Oyster Lake at the Gulf of Mexico	5.3	8.2
8	at Draper Lake at the Gulf of Mexico	5.3	8.2
9	at Blue Gulf Beach at the Gulf of Mexico	5.3	8.2
10	just west of Big Redfish Lake at the Gulf of Mexico	5.3	8.2
11	at Big Redfish Lake at the Gulf of Mexico	5.3	8.2
12	just east of Big Redfish Lake at the Gulf of Mexico	5.3	8.2
13	just northwest of Alligator Lake at the Gulf of Mexico	5.3	8.2
14	about 2,000 feet southeast of Grayton Beach	5.3	8.2

TABLE 4 - TRANSECT LOCATIONS, STILLWATER STARTING ELEVATIONS, AND INITIAL WAVE CREST ELEVATIONS
(Continued)

Transect	Location	Elevation (Feet) Stillwater	Wave Crest
15	about 2,500 feet southeast of Grayton Beach at the Gulf of Mexico	5.3	8.2
16	at Seagrove Beach at the Gulf of Mexico	5.3	8.2
17	about 1,500 feet northwest of Eastern Lake at the Gulf of Mexico	5.3	8.2
18	at Eastern Lake at the Gulf of Mexico	5.3	8.2
19	about 2,400 feet southeast of Eastern Lake at the Gulf of Mexico	5.3	8.2
20	at Deer Lake at the Gulf of Mexico	5.3	8.2
21	about 2,000 feet southeast of Deer Lake at the Gulf of Mexico	5.3	8.2
22	about 4,300 feet southeast of Deer Lake at the Gulf of Mexico	5.3	8.2
23	about 2.2 miles southeast of Camp Creek Lake at the Gulf of Mexico	5.3	8.2
24	about 2.6 miles southeast of Camp Creek Lake at the Gulf of Mexico	5.3	8.2
25	at Powell Lake just southeast of the Walton-Bay county boundary at the Gulf of Mexico	5.3	8.2
26	about 1.3 miles north of Horseshoe Bayou at Choctawhatchee Bay	2.6	4.0

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TABLE 4 - TRANSECT LOCATIONS, STILLWATER STARTING ELEVATIONS, AND INITIAL WAVE CREST ELEVATIONS
(Continued)

Transect	Location	Elevation (Feet) Stillwater	Wave Crest
27	about 5,000 feet north of Hogtown Bayou at Choctawhatchee Bay	3.1	3.7
28	just north of the mouth of the Choctawhatchee River at Choctawhatchee Bay	6.8	10.0
29	about 3,500 feet north of Wheeler Point at Choctawhatchee Bay	6.3	9.8
30	about 2,300 feet east of Motes Point at Choctawhatchee Bay	5.8	8.5
31	at Motes Point at Choctawhatchee Bay	5.5	8.4
32	about 2,700 feet southeast of Piney Point at Choctawhatchee Bay	5.6	8.0
33	just southeast of Basin Bayou at Choctawhatchee Bay	4.7	7.3
34	at Hammock Point at Choctawhatchee Bay	3.7	5.2
35	at White Point about 1.6 miles west of the Okaloosa-Walton county boundary at Choctawhatchee Bay	3.0	4.3

Figure 4 represents a sample transect that illustrates the relationship between the stillwater elevation, the wave crest elevation, the ground elevation profile, and the location of the A/V zone boundary.

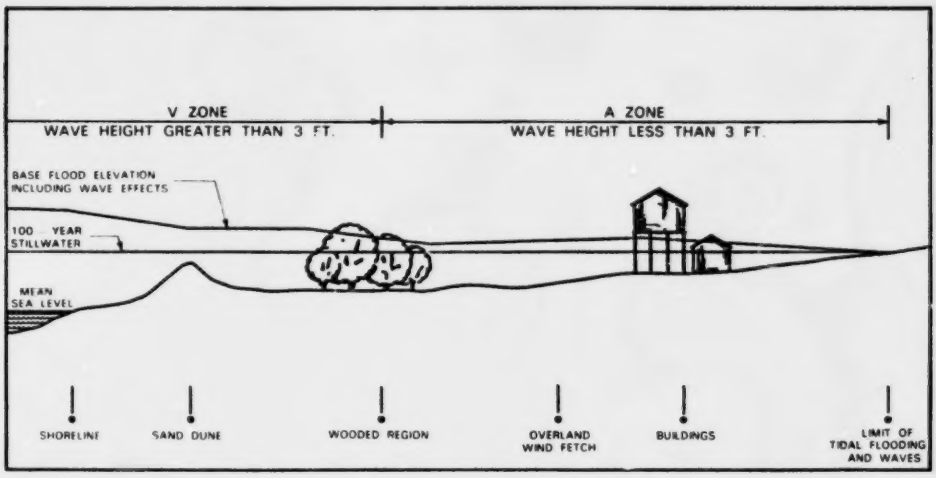

FIGURE 4 - Transect Schematic

After analyzing wave heights along each transect, wave elevations were interpolated between transects. Various source data were used in the interpolation, including topographic maps (Reference 18) and engineering judgment. Controlling features affecting the elevations were identified and considered in relation to their positions at a particular transect and their variation between transects.

All elevations are referenced to the NGVD. Elevation reference marks used in this study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24000 with a contour interval of 5 or 10 feet (References 17 and 18). For each coastal

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flooding source studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each transect. Between transects, the boundaries were interpolated using the above referenced maps.

For the streams studied by approximate methods, only the 100-year flood plain boundary was delineated using the Type 15 Flood Insurance Study, Maps of Flood Prone Areas at a scale of 1:24000 and contour intervals of 10 and 5 feet, and a normal depth analysis (References 21, 22, and 23).

The 100- and 500-year flood plain boundaries are shown on the Flood Boundary and Floodway Map. In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year flood plain boundary has been shown. Small areas within the flood plain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on flood plains, such as structures and fill, reduces the flood-carrying capacity, increases the flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations were tabulated at selected cross sections for each stream segment for which a floodway was computed and are presented in Table 5, Floodway Data.

As shown on the Flood Boundary and Floodway Map, the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and the 100-year flood plain boundaries are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 5.

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
ALAQUA CREEK								
A	450	1487	7672	1.8	5.2	2.2[2]	3.2	1.0
B	1450	1050	5095	2.7	5.2	2.8[2]	3.8	1.0
C	2350	1183	5740	2.4	5.2	3.4[2]	4.4	1.0
D	3950	628	5168	2.7	5.2	3.9[2]	4.9	1.0
E	5150	1339	8036	1.7	5.2	4.2[2]	5.2	1.0
F	6650	734	4808	2.8	5.2	4.4[2]	5.4	1.0
G	8650	1171	7806	1.8	5.3	5.3	6.3	1.0
H	11,140	1426	10,398	1.3	6.6	6.6	7.6	1.0
I	12,140	1327	8938	1.5	6.9	6.9	7.9	1.0

[1]FEET ABOVE MOUTH
[2]ELEVATIONS WITHOUT CONSIDERING STORM SURGE EFFECT FROM CHOCTAWHATCHEE BAY

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

FLOODWAY DATA

ALAQUA CREEK

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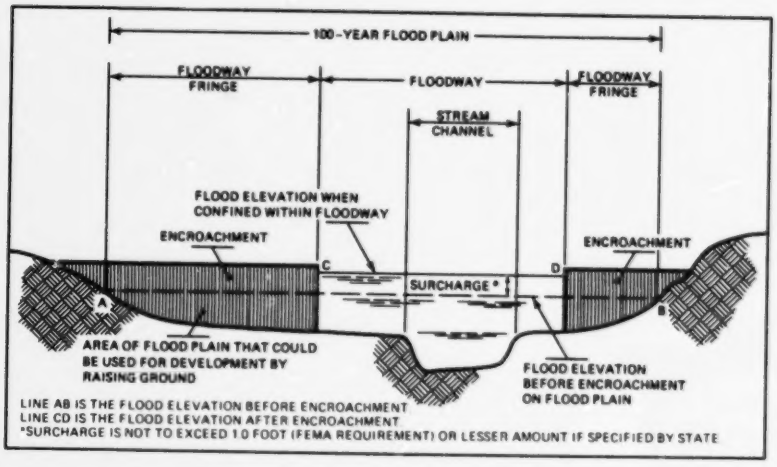
100-YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE *
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FIGURE 5 - Floodway Schematic

The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source studied in detail affecting Walton County.

5.1 Reach Determinations

For riverine studies, reaches are defined as sections of flood plain that have relatively the same flood hazard, based on the weighted average difference in water-surface elevations between the 10- and 100-year floods. This difference may not have a variation greater than that indicated in the following table for more than 20 percent of the reach:

Average Difference Between 10- and 100-year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the riverine flooding sources of Walton County are shown on the Flood Profiles and summarized in Table 6, Flood Insurance Zone Data.

In coastal areas, reaches are limited to the distance for which the 100-year flood elevation does not vary more than 1.0 foot. The location of these reaches are shown on the Flood Insurance Rate Map.

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5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then used with depth-damage relationships for various classes of structures to establish actuarial insurance rate tables.

The FHF for a riverine reach is the weighted average difference between the 10- and 100-year flood water-surface elevations rounded to the nearest 0.5 foot, multiplied by 10, and shown as a 3-digit code.

The FHF for areas subject only to storm surge flooding is the difference between the 10- and 100-year stillwater elevations rounded to the nearest 0.5 foot, multiplied by 10, and shown as a 3-digit code. For areas with wave heights less than 3 feet, the FHF is the weighted average difference between the 100-year wave crest elevation and the 10-year stillwater elevation. For areas with wave heights greater than 3 feet, the FHF is determined using the difference between the 10- and 100-year stillwater elevations multiplied by 1.55, then rounded to the nearest 0.5 foot, multiplied by 10, and shown as a 3-digit code.

For example, if the difference between elevations is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard and the FHF, respectively. A unique zone number is associated with each possible FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater.

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations are shown or FHFs determined.
Zones A2-A10, A12:	Special Flood Hazard Areas inundated by the 100-year flood, with base flood elevations shown, and zones subdivided according to FHFs.
Zones V8-V11:	Special Flood Hazard Areas along coasts inundated by the 100-year flood that have additional velocity hazards associated with waves of 3-foot amplitude or greater, with base flood elevations shown, and zones subdivided according to FHFs.
Zone B:	Areas between Special Flood Hazard Areas and the limits of the 500-year flood; areas that are protected from the

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100- and 500-year floods by dike, levee, or other water control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and, areas subject to 100-year flooding from sources with drainage areas of less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flooding; not subdivided.

Flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community are shown in Table 6, Flood Insurance Zone Data, and Table 7, Coastal Flood Insurance Zone Data.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for Walton County is, for insurance purposes, the principal product of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines for riverine flooding sources show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. For coastal flooding sources, the expected water-surface elevations of the base (100-year) flood are shown as a weighted average within zones. Each whole-foot elevation is delineated except where cartographic considerations require the combination of two or more elevation zones. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the National Flood Insurance Program.

6.0 OTHER STUDIES

A Flood Insurance Study has been prepared for the City of DeFuniak Springs, Walton County, Florida (Reference 24). The results of the DeFuniak Springs study are in agreement with this study.

Type 19 Flood Insurance Studies are currently being prepared for Bay and Okaloosa Counties, Unincorporated Areas, Florida (References 25 and 26). These studies are in agreement with this Flood Insurance Study.

A Type 15 Flood Insurance Study for the City of Freeport, Walton County, Florida, is in progress (Reference 27). The results of the Freeport study are in agreement with this study.

Due to its more detailed analysis, this Flood Insurance Study supersedes the previously printed Flood Insurance Rate Map for the Type 15 Flood Insurance Study for Walton County (Reference 21).

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (FEET NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
CHOCTA-WHATCHEE RIVER							
REACH 1	0290,0295,0305, 0310,0315,0320, 0355,0360	−4.6	N/A	N/A	045	A9	VARIES—SEE MAP
REACH 2	0165,0170,0230, 0235,0240,0245, 0305,0310	−6.2	N/A	N/A	060	A12	VARIES—SEE MAP
ALAQUA CREEK							
REACH 1	0260,0280	−2.5	−0.8	1.9	025	A5	VARIES—SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

CHOCTAWHATCHEE RIVER—ALAQUA CREEK

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FLOODING SOURCE	TRANSECT	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND 10% (10-YEAR)	FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3,4] (FEET NGVD)
GULF OF MEXICO	1	0330	−4.0[5] −3.5[5]	040 035	V8 A7	7– 8 5– 7
	2	0330	−4.2[5] −3.0[5]	040 030	V8 A6	8– 9 6– 8
	3,4,5	0330,0335	−3.9[5]	040	V8	7– 8
	N/A	0335,0365,0370	−2.5	025	A5	5
	6	0335	−3.9[5] −3.0[5]	040 030	V8 A6	7– 8 6
	7	0335	−3.9[5] −3.5[5]	040 035	V8 A7	7– 8 5– 7
	8	0335	−3.9[5] −2.5[5]	040 025	V8 A5	7– 8 5– 7
	9	0335	−3.9[5]	040	V8	7– 8
	10,13	0335,0365	−3.9[5] −4.0[5]	040 040	V8 A8	7– 8 5– 7
	11	0335,0365	−3.9[5] −2.5[5]	040 025	V8 A5	7– 8 5– 7
	12	0365	−3.9[5] −3.0[5]	040 030	V8 A6	7– 8 5– 7

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE IN FEET
[3]ROUNDED TO NEAREST FOOT
[4]DUE TO MAP SCALE LIMITATIONS, BASE FLOOD ELEVATIONS SHOWN ON MAP MAY REPRESENT AVERAGE ELEVATIONS FOR THE ZONES DEPICTED
[5]INCLUDES EFFECTS OF WAVE ACTION

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

COASTAL FLOOD INSURANCE ZONE DATA

GULF OF MEXICO

FLOODING SOURCE	TRANSECT	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND 10% (10-YEAR)	FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3,4] (FEET NGVD)
GULF OF MEXICO	14	0365	−3.9[5]	040	V8	7− 8
			−3.5[5]	035	A7	5− 7
	15,16,17	0365	−3.9[5]	040	V8	7− 8
	18	0365	−3.9[5]	040	V8	7− 8
			−3.5[5]	035	A7	5− 7
	19	0370	−3.9[5]	040	V8	7− 8
	20	0370	−3.9[5]	040	V8	7− 8
			−4.0[5]	040	A8	6− 7
			−2.5[5]	025	A5	5− 7
	21	0370	−3.9[5]	040	V8	7− 8
			−3.5[5]	035	A7	5− 7
	22	0370	−3.9[5]	040	V8	7− 8
			−2.5[5]	025	A5	5− 7
	23,24	0370	−3.9[5]	040	V8	7− 8
	*25	0370	−3.9[5]	040	V8	7− 8
CHOCTAWHATCHEE BAY	N/A	0330	−1.1	010	A2	3
	N/A	0330	−1.1	010	A2	2
	N/A	0265,0330	−1.2	010	A2	3

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE IN FEET
[3]ROUNDED TO NEAREST FOOT
[4]DUE TO MAP SCALE LIMITATIONS, BASE FLOOD ELEVATIONS SHOWN ON MAP MAY REPRESENT AVERAGE ELEVATIONS FOR THE ZONES DEPICTED
[5]INCLUDES EFFECTS OF WAVE ACTION
*LOCATED OUTSIDE OF COUNTY BOUNDARY

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL
(UNINCORPORATED AREAS)

COASTAL FLOOD INSURANCE ZONE DATA

GULF OF MEXICO—CHOCTAWHATCHEE BAY

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FLOODING SOURCE	TRANSECT	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND 10% (10-YEAR)	FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3,4] (FEET NGVD)
CHOCTAWHATCHEE BAY	26	0265,0330	−1.5[5]	015	A3	3− 4
	N/A	0330,0335	−0.8	010	A2	2
	N/A	0335	−1.3	015	A3	3
	N/A	0270,0335	−1.9	020	A4	4
	27	0270	−2.0[5]	020	A4	3− 4
	N/A	0270	−1.7	015	A3	3
	N/A	0270,0335	−2.1	020	A4	4
	N/A	0335,0355	−2.6	025	A5	5
	N/A	0355	−2.9	030	A6	6
	N/A	0290,0295,0355	−3.6	035	A7	7
	N/A	0360,0370	−3.8	040	A8	7
	N/A	0370	−3.9	040	A8	8
	28	0290,0355	−4.0[5] −5.6[5] −5.0[5]	040 055 050	V8 V11 A10	8 9−10 8− 9

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE IN FEET
[3]ROUNDED TO NEAREST FOOT
[4]DUE TO MAP SCALE LIMITATIONS, BASE FLOOD ELEVATIONS SHOWN ON MAP MAY REPRESENT AVERAGE ELEVATIONS FOR THE ZONES DEPICTED
[5]INCLUDES EFFECTS OF WAVE ACTION

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

COASTAL FLOOD INSURANCE ZONE DATA

CHOCTAWHATCHEE BAY

FLOODING SOURCE	TRANSECT	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND 10% (10-YEAR)	FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3,4] (FEET NGVD)
CHOCTAWHATCHEE BAY	29	0280,0290	−5.1[5] −4.0[5]	050 040	V10 A8	9−10 8− 9
	N/A	0280,0290	−3.9	040	A8	8
	30	0290	−4.7[5] −3.5[5]	045 035	V9 A7	9 6− 7
	31	0270,0290	−4.5[5] −3.0[5]	045 030	V9 A6	8 6− 7
	32	0260,0270,0290	−4.5[5] −3.0[5]	045 030	V9 A6	8 6
	N/A	0260,0280	−2.7	025	A5	5
	33	0260,0270	−3.9[5] −2.5[5]	040 025	V8 A5	7 5− 7
	34	0255,0260,0265, 0270	−2.0[5]	020	A4	4− 5
	N/A	0255,0265	−1.4	015	A3	3
	35	0265	−2.3[5]	025	A5	3− 4

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE IN FEET
[3]ROUNDED TO NEAREST FOOT
[4]DUE TO MAP SCALE LIMITATIONS, BASE FLOOD ELEVATIONS SHOWN ON MAP MAY REPRESENT AVERAGE ELEVATIONS FOR THE ZONES DEPICTED
[5]INCLUDES EFFECTS OF WAVE ACTION

TABLE 7

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

COASTAL FLOOD INSURANCE ZONE DATA

CHOCTAWHATCHEE BAY

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7.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, Federal Emergency Management Agency, 1371 Peachtree Street, N.E., Suite 736, Atlanta, Georgia 30309.

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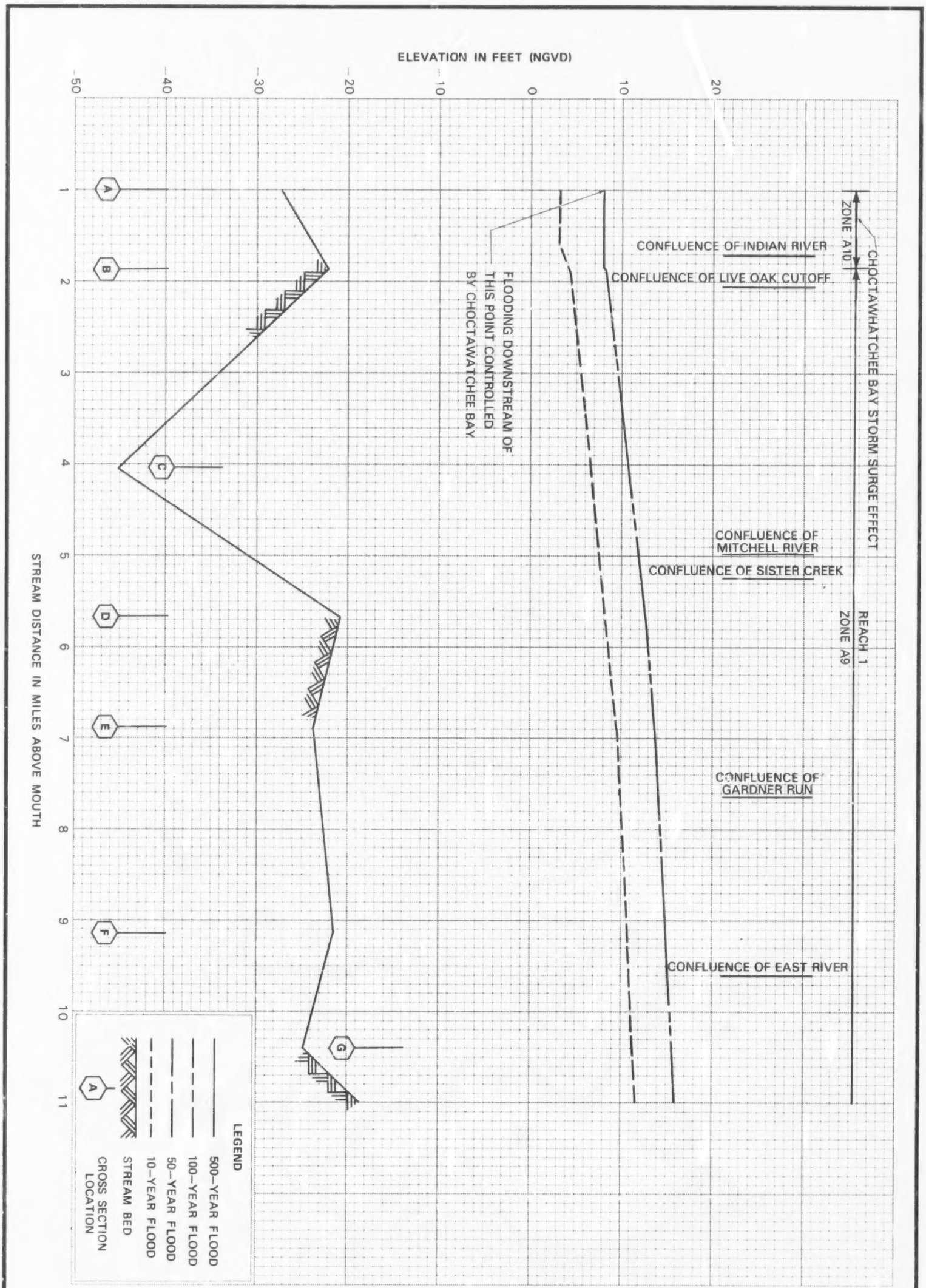

01P	FEDERAL EMERGENCY MANAGEMENT AGENCY **WALTON COUNTY, FL** (UNINCORPORATED AREAS)	**FLOOD PROFILES** **CHOCTAWHATCHEE RIVER**

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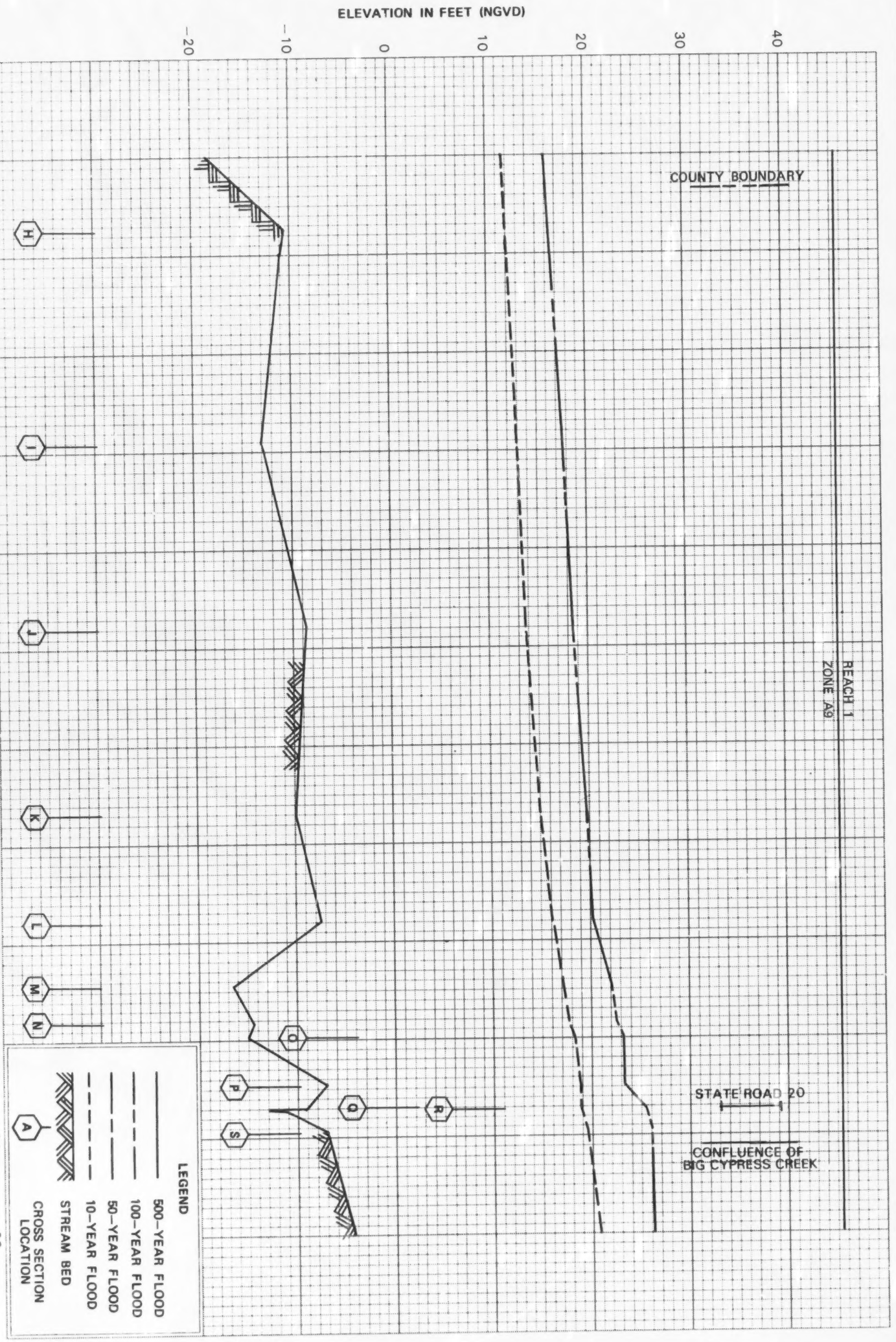

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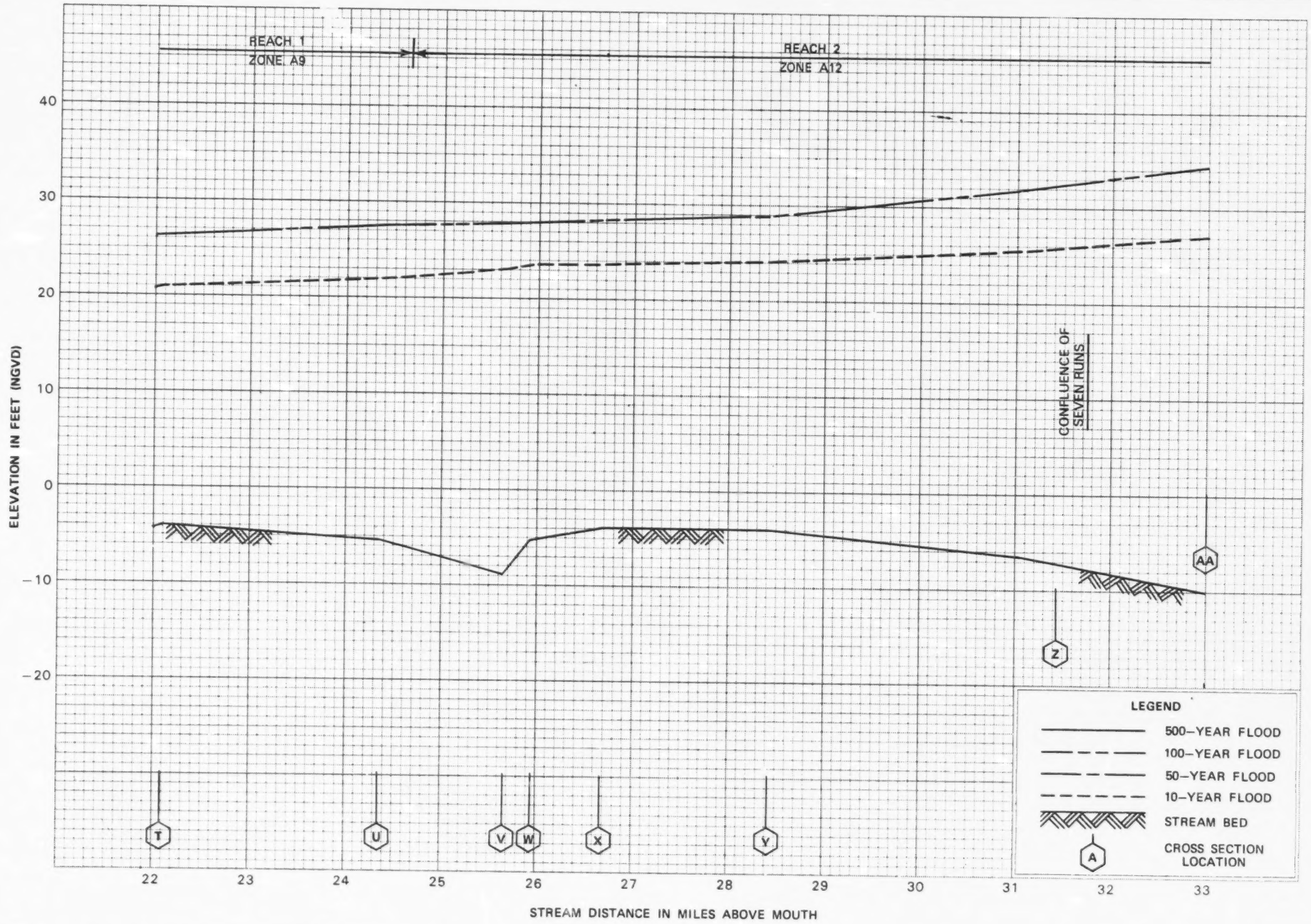

FLOOD PROFILES

CHOCTAWHATCHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

03P

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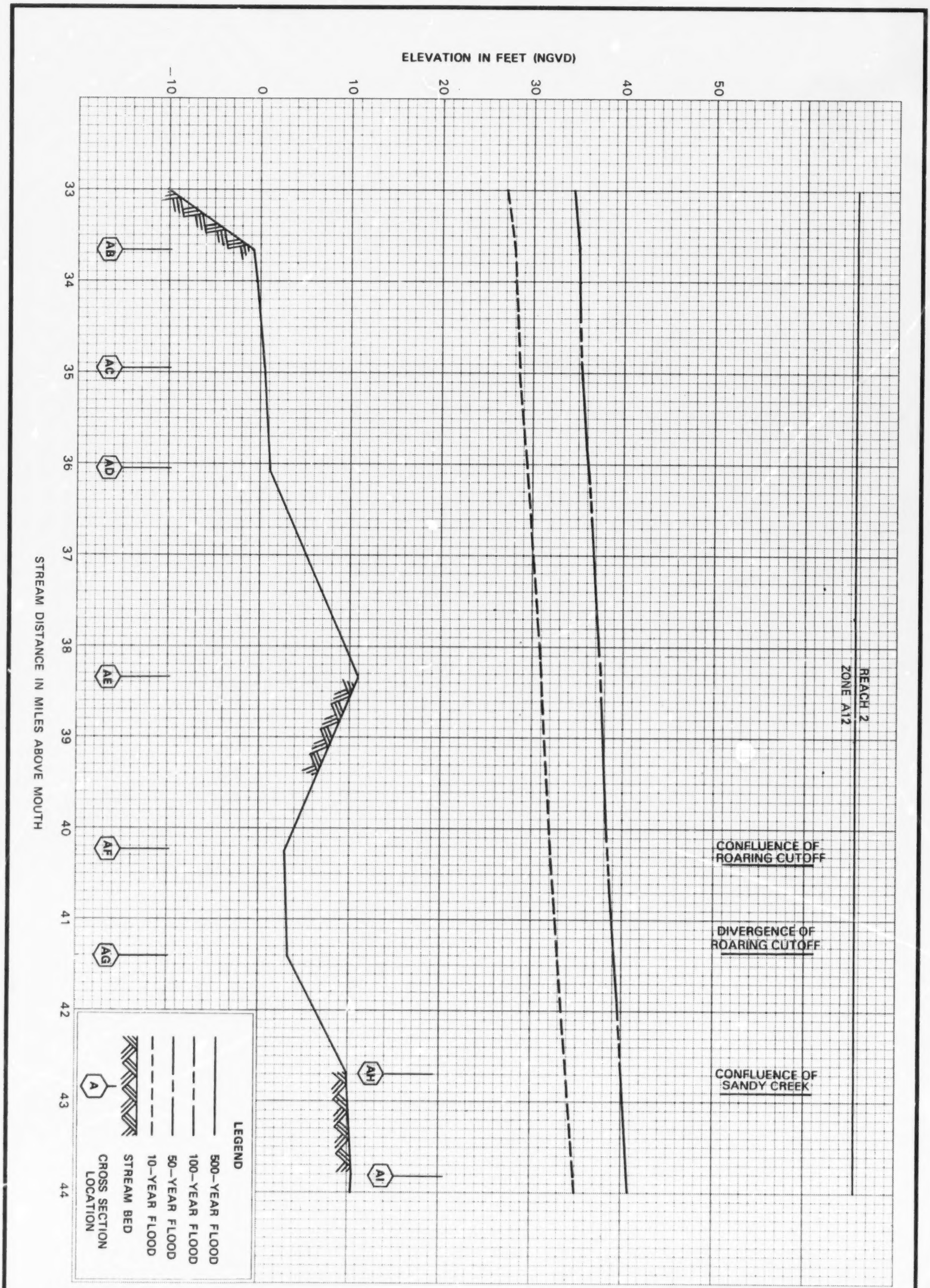

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

FLOOD PROFILES

CHOCTAWHATCHEE RIVER

04P

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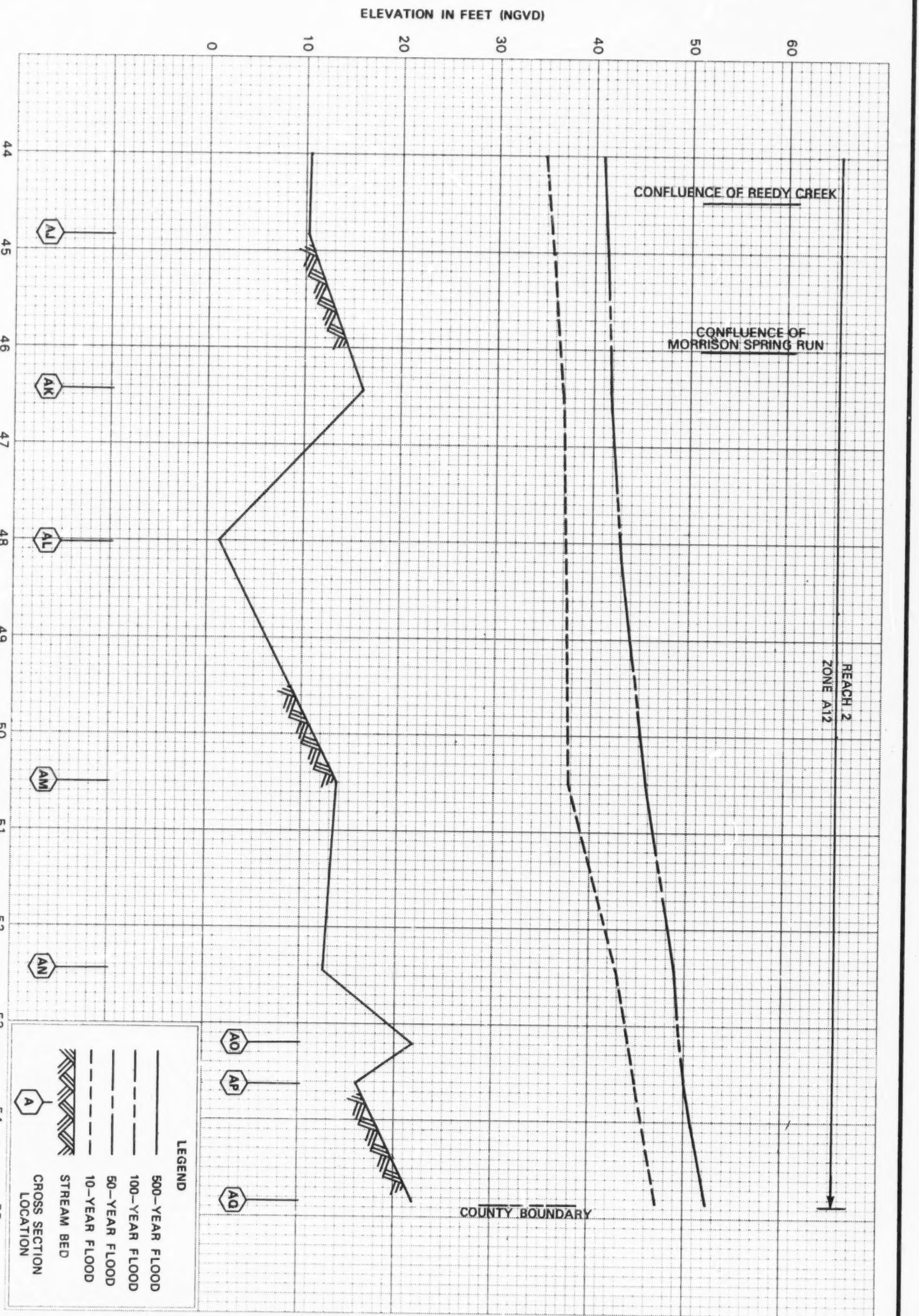

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FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

FLOOD PROFILES

CHOCTAWHATCHEE RIVER

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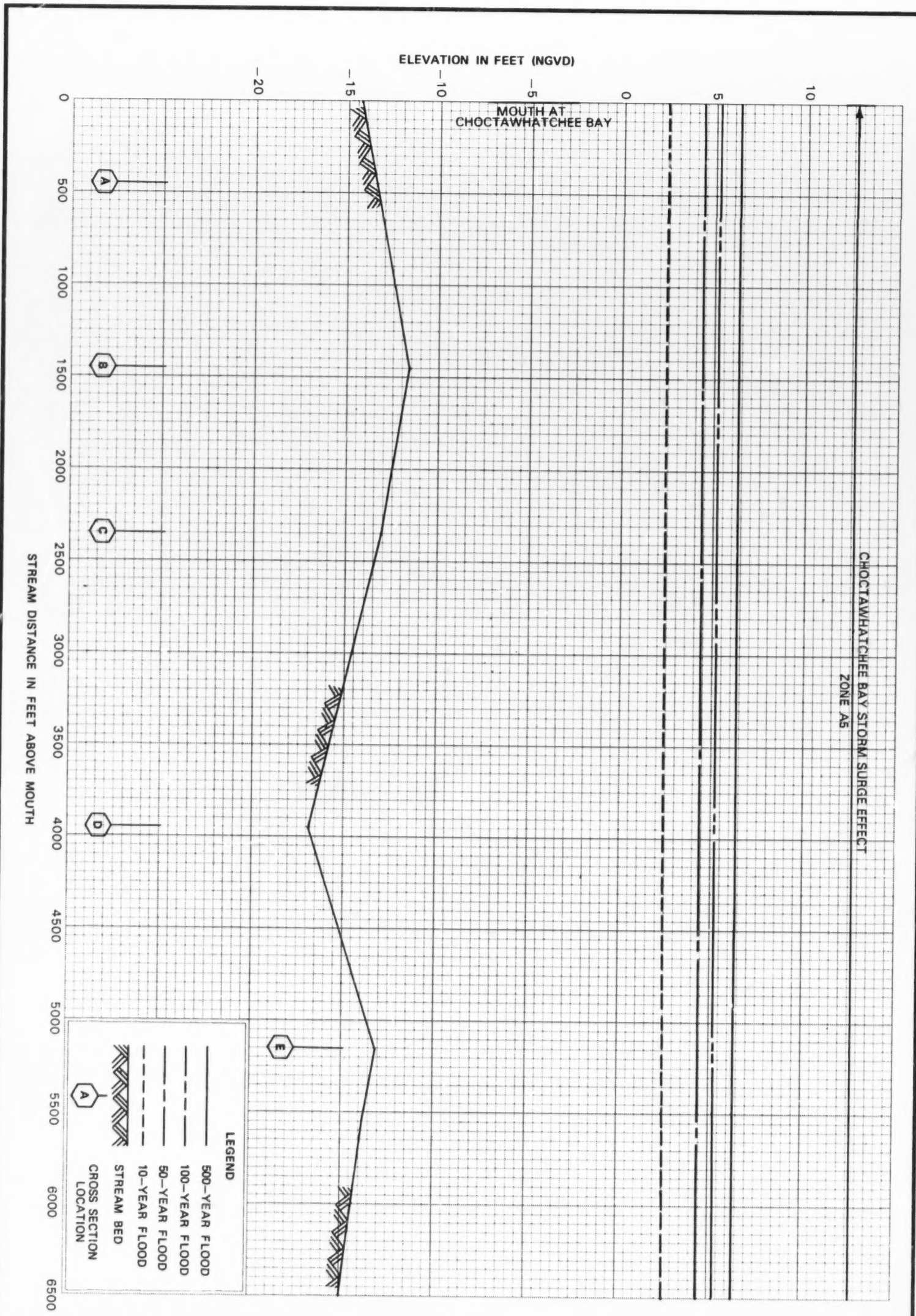

06P	FEDERAL EMERGENCY MANAGEMENT AGENCY **WALTON COUNTY, FL** (UNINCORPORATED AREAS)	**FLOOD PROFILES** **ALAQUA CREEK**

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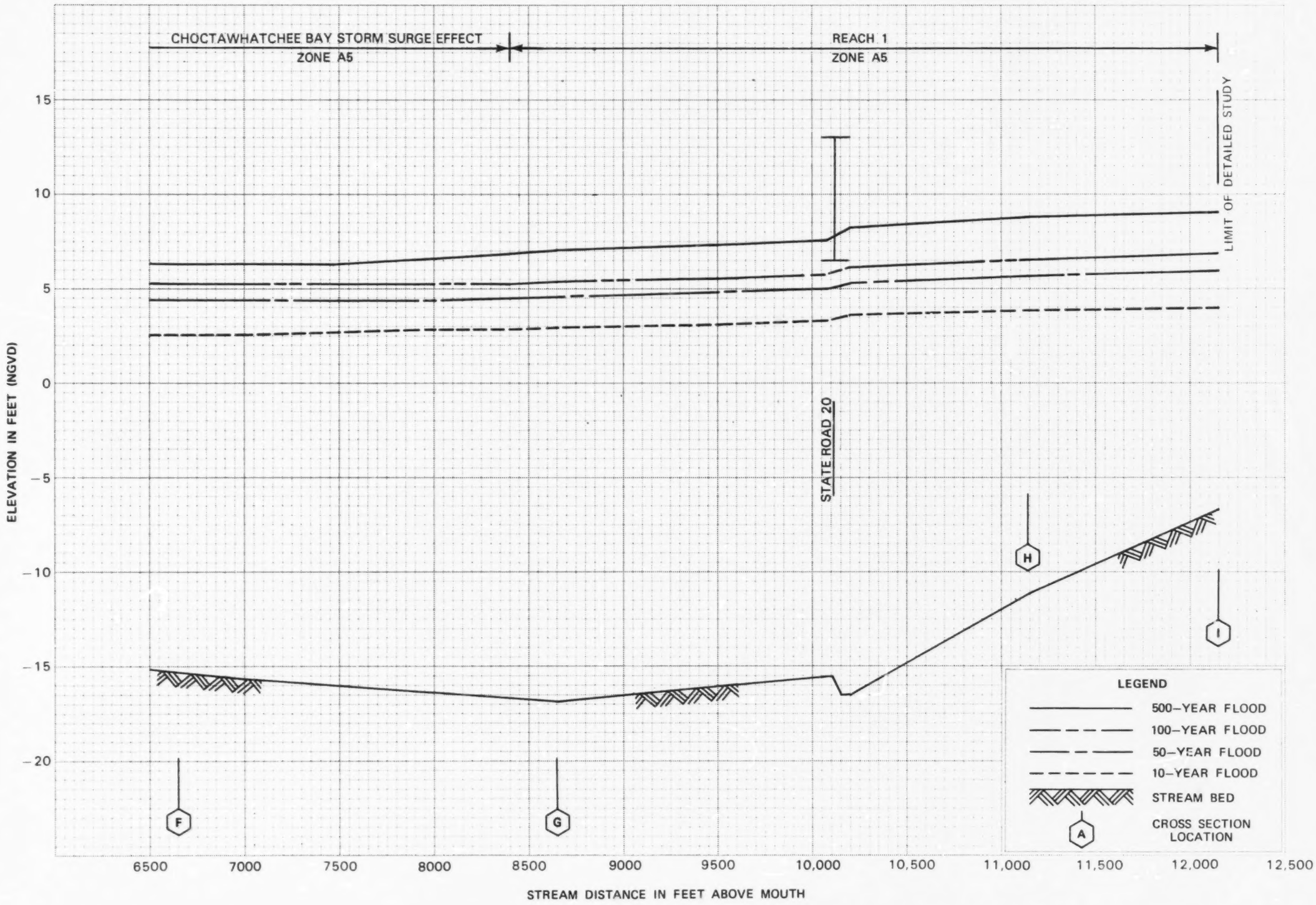

FLOOD PROFILES

ALAQUA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALTON COUNTY, FL

(UNINCORPORATED AREAS)

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